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# Preliminary Exploration of Foreign Librarians' Role Transformation Characteristics Under Technological Environment Transformation - Postprint

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## Abstract

**Purpose/Significance:** As the technological environment of libraries undergoes transformation and their functions expand, the role and image of librarians have been endowed with numerous new expectations. Analyzing the role transformation of librarians can both elucidate the requirements that environmental changes impose on professional development and provide recommendations for enhancing librarian competencies and better addressing the pressures of technological change.

**Method/Process:** This study utilizes bibliographic information from foreign journal literature on librarian roles collected from databases, employing title word analysis to classify librarian roles in existing research and describing the job responsibilities of librarians based on their role positioning.

**Results/Conclusion:** Existing research demonstrates the highest level of attention toward subject librarians, teaching librarians, medical librarians, among others. Technological transformation has also given rise to new positions such as data librarians and social media librarians. Librarian roles exhibit characteristics including refined classification, enhanced specialization and interactivity, and significant role overlap. The influence of technology on librarian roles is progressively intensifying.

## Full Text

## Preamble

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## A Preliminary Study on the Characteristics of Foreign Librarians' Role Transformation in Technological Environment Changes

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### Abstract

**[Purpose/Significance]** As library technological environments evolve and functions expand, librarians' roles and professional images are endowed with many new expectations. Analyzing the role transformation of librarians not only reveals how environmental changes shape professional development requirements but also provides recommendations for enhancing librarians' competencies and better coping with technological pressures. **[Method/Process]** This study collected bibliographic information from foreign English-language journal articles on librarian roles from major databases. Using title word analysis, we classified librarian roles in existing research and described job responsibilities according to role positioning. **[Result/Conclusion]** Existing research shows highest attention to subject librarians, teaching librarians, and medical librarians. Technological change has also spawned new positions such as data librarians and social media librarians. Librarian roles exhibit characteristics of increasing specialization, professionalization, enhanced interactivity, and significant role overlap, with technology's influence on librarian roles gradually strengthening.

**Keywords:** librarian; role change; technology adoption

**Classification Number:** G251.6

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### 1. Research Background

Rapid developments in information technology have prompted fundamental changes in libraries' core operations, compelling librarians to venture into fields beyond their traditional expertise. Librarians in all positions must now enhance their competencies in information technology application, information acquisition, information organization, resource evaluation, communication and conflict resolution, and subject knowledge learning. They are expected to engage in digital collection management, knowledge organization, information services, teaching, research, and administration while facing challenges including budget reductions, capacity building, inadequate facilities, and optimizing service innovation approaches.

As libraries' social, technological, and cultural environments continue to evolve, librarians' job responsibilities and roles have transformed accordingly. While technology has automated some traditional tasks, it has simultaneously introduced more innovative work content, endowing librarians with entirely new

roles such as data librarians, media librarians, and digital instruction librarians. These positions demand high qualifications, involve heavy workloads, require real-time responsiveness, and necessitate rapid mastery of new service content and technologies, making librarian roles more complex and blurring boundaries with related professions, which can cause psychological stress.

## 2. Research Questions and Methods

As library technological environments and spaces transform, industry development accelerates, and user needs become more diverse, librarians' work content, methods, media, and service targets have also changed. Librarianship has become an increasingly challenging profession. In this transformation, librarians' work scenarios have shifted from traditional library-centric physical spaces to hybrid service environments embedded in research, teaching, medical services, online learning, social media, and campus/community/public culture. Librarians have become professional service personnel meeting readers' diverse and personalized needs.

Although technology has diversified librarians' work methods, it has also increased technological dependency and pressure, affecting the efficiency of role transformation. Research indicates that librarians, like other professionals, experience role ambiguity, role overload, and burnout, which negatively impact their psychological well-being, health, and job performance. Additionally, technological innovation automates some manual tasks while creating new roles that are high-demand, heavy-duty, and real-time intensive, making librarian roles more complex and boundaries with related positions increasingly blurred, leading to psychological pressure.

Domestic scholars have consistently focused on librarians' professional roles and images, examining role positioning during different technological development stages and new roles in innovative library services (such as information commons, institutional repositories, MOOCs, and picture book reading). They have also analyzed foreign librarians' responsibilities, including trends in American academic librarians' duties. However, systematic analysis of role requirements and development characteristics for domestic and foreign librarians is lacking, with insufficient research on newly emerging roles. In contrast, foreign research is more abundant and comprehensive. Therefore, this study collected foreign English-language journal literature on librarian roles published after 2000, using content analysis to preliminarily summarize foreign research attention on different types of librarian roles and analyze role requirements and transformation characteristics in various service scenarios, providing a foundation for helping librarians cope with work pressure and enhance competencies during role transitions.

Using databases including Web of Science, EBSCO, Emerald, SpringerLink, and ScienceDirect, we searched with the query "Title=librarian AND role" to initially browse relevant English journal articles. To integrate bibliographic in-

formation from different databases, we used the Duxiu database to obtain 1,029 journal article records from 2000-2017, resulting in 998 valid records after removing duplicates. The time distribution of these articles is shown in Figure 1 [Figure 1: see original paper]. The 2000-2017 timeframe was selected because libraries had already achieved relatively mature internet technology application by 2000, and the subsequent 17 years witnessed multiple technological transformations and space renovations (including mobile internet, social media, IoT, and big data), making it suitable for analyzing librarian role transformation from a technological change perspective.

We downloaded the bibliographic records into Excel and conducted word frequency statistics and classification analysis on title words to reveal which librarian types and positions received most research attention, what role requirements existed, and what role challenges and work pressures librarians faced in different scenarios. Based on title word analysis and research objectives, we downloaded full texts describing different librarian roles (supplementing with additional searches for newer and special roles using role names as keywords) and selected empirical findings to summarize job responsibilities and role descriptions of different librarian types abroad.

### **3. Foreign Librarians Based on Journal Title Word Analysis**

#### **3.1 Librarian Role Statistics**

Foreign scholars particularly focus on several types: subject/academic/professional librarians, teaching/instruction librarians, and medical/health/clinical librarians. Technology-related types include social media librarians, data librarians, and digital resource acquisition librarians. New librarian types generally relate to changes in library service models and technology adoption. We classified librarian role types appearing in article titles according to library type, industry/profession, and job position/function, as shown in Table 1 .

Using word frequency analysis software (English Word Frequency Master), we analyzed title words after removing stop words (the/of/in/and/for) and non-statistical terms like librarian/role. The most frequent adjective was “new” (150 occurrences). High-frequency words related to librarian roles, identity, and work scenarios included information, academic, school, education/educational, health/healthcare, professional/profession, medical/medicine/law (librarian). Technology-related terms included networking, web, digital, electronic, online, internet, social media, and data. Words related to transformation trends and pressures included new, changing/change, development/developing, challenge, responsibility, expanding, supporting/support, promote/promoting, and awareness. Manual analysis of these results yielded word frequencies for terms related to librarian roles in titles.

## 3.2 Role Descriptions for Different Librarian Types

Although title word analysis has limitations (e.g., limited word count), the extracted terms clearly reflect development trends in technological change, role transformation, and functional expansion, as well as scholarly attention to librarian role changes. Librarian role types are described as follows:

### 3.2.1 By Library Type

Foreign research shows clear industry characteristics, with studies on school librarian, university librarian, and public librarian, though few examine role changes from this perspective alone. This is because research typically focuses on specific functional positions (e.g., subject services, reference, circulation). University and public librarian roles are more finely differentiated, with in-depth research on each major position, while school librarian roles are more general, reflecting actual work conditions. School librarians play multiple roles including librarian, science popularization, teaching and teaching support, technical training, external communication, student activities, and online services, potentially facing stronger role pressure and conflict. Technological development has also changed school librarians' responsibilities—they were once the school's sole technical service providers, but as specialized educational technology personnel increased, their technical work pressure decreased. However, they remain important facilitators of educational technology application. In 2010, the International Society for Technology in Education (ISTE) issued a statement on "The Role of School Librarians in Promoting Educational Technology," stating that "librarians should act as technology coordinators supporting school-wide IT use, become information literacy and technology experts, provide teacher training, cultivate students as qualified digital citizens, and help them succeed in education, work, and society."

Public librarians, beyond daily work similar to other library types, often need to cooperate with local communities and social service departments in health education promotion to improve users' health literacy and help achieve information democracy and effective social information dissemination.

### 3.2.2 By Industry/Profession

Librarian roles are closely connected to their industry and professional background. The most numerous research papers focus on the medical and health field, primarily clinical, health, and medical librarians. Title words frequently include information, health literacy, and clinical research activity, reflecting medical librarians' work characteristics. Analysis of literature from 1990-2012 on medical librarian role transformation shows new roles including embedded librarians (clinical information, bioinformatics, public health information, disaster information specialists), systematic review librarians, emerging technology librarians, medical continuing education librarians, fund management/application librarians, data management librarians, scholarly communication librarians, metadata librarians, translation librarians, clinical medical librarians, and consumer health information librarians. Due to their special work environment,

medical librarians undertake some healthcare services such as helping patients access medical records, promoting health knowledge, improving patients' health literacy, assisting in residency training programs, providing information and psychological support for chronic disease patient groups, and offering extracurricular medical career expansion programs for interested students.

Medical librarians can address “health illiteracy” among residents, as studies show poor health status correlates with low literacy and inability to understand medical information. Many physicians are unaware of patients' literacy difficulties or available assessment tools, and limited medical resources constrain good doctor-patient communication. Medical librarians can use patient literacy assessment tools (e.g., Short Test of Functional Health Literacy in Adults, STOFHLA) to develop formulas evaluating medical materials' readability, integrate relevant knowledge into medical organizations, and ultimately help modify information and service policies to provide better support for both parties. Librarians, especially subject librarians, should act as technology intermediaries helping medical staff identify information resources and improve information presentation, which effectively meets real-time clinical knowledge needs. Librarians do not diagnose patients or provide medical advice but help filter, evaluate, and assess the quality, authority, relevance, and readability of multiple information sources—particularly important given the vast amount of online health information of varying quality that often leads to misunderstanding, over-self-diagnosis, and information anxiety.

Another specialized type is law librarians. The American Association of Law Libraries issued competency requirements in the early 21st century covering core and specialized competencies, with the latter including library management, reference and user services, information technology, collection preservation and management, and teaching. Law librarians with multiple degrees are common, and scholars argue they should be selected from legal professionals with library education. Research focuses on their performance in business operations, legal research, and legal education, emphasizing that technological progress permeates all areas of legal study, research, and teaching. Librarians must evaluate digital resource quality, assist faculty and students in knowledge acquisition, teach legal research methodology, and master continuously updated IT. Like other librarians, law librarians face rising demands for data collection, management, and empirical analysis services.

Theological librarians also appear in foreign literature, with special functions including providing spiritual support and encouragement for students and fundraising. While China also has religious libraries (e.g., Longquan Library), they remain underdeveloped domestically.

### **3.2.3 By Specific Position, Function, and Work Method**

As libraries adopt new technologies and transform, librarian roles have evolved from traditional subject, reference, and systems librarians to embedded librarians, teaching librarians, and digital resource acquisition librarians, with newer roles like social media librarians and data librarians emerging.

*Traditional Positions*

Among traditional roles, professional and subject librarians receive the most attention in foreign research (149 articles mention subject librarian roles), reflecting their development over the past decade. Subject services remain a core university library function, with service methods showing new characteristics due to technological changes. Public librarians with specific professional backgrounds also undertake social service responsibilities similar to subject librarians. While subject librarians have always required professional and background knowledge, experts note they still need comprehensive knowledge updates to cope with environmental and technological changes. With accelerating technology updates, improved user information literacy, and increased personalized demands, traditional librarian role updates and transformations proceed much faster than in previous technological eras, creating greater work pressure for subject/professional and reference librarians during technological transformation.

Subject librarians typically play supportive roles in research teams, providing literature retrieval for relevant sources and gaining recognition as equal team members due to their unique academic contributions. Participating in research enhances their research capabilities, which they apply to library science research, creating more connections between their research work and the library profession while building more meaningful, lasting relationships with faculty, students, and colleagues—fundamentally transforming their daily work content and forms.

Traditional technical services librarians have transformed from technical assistants, library technicians, and public service personnel to crucial technical service experts in library operations. A February 2014 survey of Canadian librarians and library technicians showed both groups perceived increasing role scope and complexity while job boundaries became increasingly blurred. Factors including technological innovation, budget cuts, restructuring, downsizing, outsourcing, expanded professional responsibilities, and changing information environments increased technical librarians' workloads. Most participated in public services and outreach, with 29.5% reporting technology-dependent work. Technical librarians are seen as "jacks-of-all-trades," with services expanding from technical support, cataloging, programming, and circulation to online services, digital resources, supervision, collection development, technical services, copyright, project management, training, and database management—often exceeding job scope with increased workload and pace, sometimes requiring new tasks without training. Another trend shows non-technical librarians must also master emerging technologies and sometimes assume technical responsibilities or guide patrons in new equipment use and training (e.g., in makerspaces), creating work pressure and technological stress.

*Expanded Traditional Roles*

Beyond traditional functions, libraries have developed embedded teaching, research, and resource services, creating embedded librarians, teaching librarians, and digital instruction librarians, though these new roles exhibit widespread functional overlap.

Foreign research pays considerable attention to teaching librarians (75 articles). Key concerns include how librarians view their teaching functions and skills, whether they accept professional pedagogical training, and their self-perception. A Canadian survey of 788 library staff on teaching showed most wanted to conduct some teaching, with some having taught for over 10 years. Most believed teaching should be part of their profession, with nearly one-third viewing it as a responsibility or expectation, though a minority considered it an imposition. Interviews with six UK academic librarians teaching information literacy courses revealed their perceptions of teaching roles, including teaching, learning support, and training. These perceptions fell into two dimensions: seeing oneself as a teacher (teaching librarian; engaged in teaching/learning support but not necessarily formal teaching) versus not seeing oneself as a teacher (not teaching but doing training work). The findings suggest teaching training and support benefit librarians and students given growing demands for librarians' teaching functions. As more academic/subject librarians are integrated into teaching systems and transform into teacher roles, switching between identities creates complex interactions, leading to questions about the legitimacy of librarians' teacher roles and inevitable role stress, with support during identity transitions affecting conversion effectiveness.

Embedded services represent important attempts to expand library functions, typically undertaken by subject/academic/professional librarians providing embedded subject services, reference, information literacy education, knowledge services, and makerspace services. The development of embedded subject librarian systems, role positioning, and service evolution are major research topics of interest. In embedded services, librarians act as project team members, provide curriculum design and teaching support, and deliver resource services, extending roles to "patent experts" embedded in research units to help researchers utilize patent information for more effective innovation.

Medical librarians' embedded assistance can encourage clinicians and nursing staff to actively participate in evidence-based research and professional development. In one project, nursing educators and medical librarians collaborated using online journal clubs to provide academic support, attempting to improve patient satisfaction through evidence-based medicine and help healthcare professionals enhance professional quality. Librarians provided online technical support, participated in clubs, facilitated academic discussions, and contributed library-related comments at appropriate moments, earning positive evaluations.

The rise of online education models has made librarians' embedded services crucial teaching support in online courses, with students benefiting from librarians' participation and integration of rich library resources. Embedded information literacy education in online courses helps establish collaboration among information literacy educators, academic liaisons, and students, producing positive outcomes. As important participants in embedded information literacy cooperative education, information professionals are expected to promote transferable skills development and collaborative/shared network work spirit. In current

blended teaching models, librarians' embedded teaching services may combine online and offline environments, participating in curriculum design, resource delivery, Q&A, and tutoring, making many teaching librarians also engaged in embedded instruction.

Librarians have conducted digital resource guidance since the digital age began, including information resource organization, delivery, evaluation, and integration. Their extensive experience makes them ideal for solving digital resource problems in the new media era. In digital environments, librarians' supportive role is increasingly important. Digital resource guidance librarians are defined as professional information personnel undertaking important user education roles, actively participating in learning and teaching activities, conducting teaching, user education, in-service training, and staff development—mostly extending beyond traditional librarian duties.

The main purpose of digital guidance for students is to encourage deep thinking about learning problems, connect learning issues with past experiences, promote knowledge sharing, and facilitate student interaction. Through librarians' digital guidance, students gain active learning skills, improved teamwork abilities, effective communication with peers, and enhanced confidence. These mentor or facilitator roles become particularly common when problem-based or inquiry learning methods are introduced.

Digital guidance responsibilities overlap partially with online information literacy education. For example, American children growing up in media-saturated societies are often not adept at selecting and evaluating digital content, prompting North American schools to utilize librarians' information literacy education for digital resource guidance. In online learning environments, librarians' digital guidance roles and responsibilities are similar to teachers' but with different emphases: designing and providing inquiry-based information literacy guidance; improving students' knowledge of information, media, visualization, and technology; integrating emerging technologies into teaching strategies to support diverse learning styles, interests, and abilities; and promoting critical thinking, knowledge acquisition, and creation.

Researchers consider librarians well-suited as digital resource mentors in digital environments, with responsibilities distinct from traditional teaching roles (see Table 3 ). These responsibilities are challenging for librarians not engaged in teaching or online education, requiring high professional background knowledge. Currently, besides teaching librarians, subject librarians, professional librarians, and media librarians are increasingly participating in digital guidance work.

Beyond academic digital resource acquisition and online education, librarians practice digital guidance functions in healthcare (though not explicitly titled as such), providing research support and expertise for health information education platforms and developing scientifically reliable health education information for the public. In health information dissemination projects, librarians answer website users' questions in their areas of expertise, review health information

resources to ensure currency based on scientific trends, provide personalized services, analyze how media and technology affect user behavior, and enhance health information website value. They also educate users to improve information selection and evaluation skills, search abilities, health information reading and comprehension, and manage psychological changes during health information searching (e.g., health information anxiety), including how to communicate search findings with physicians for more objective diagnosis and treatment. Digital guidance librarians can be seen as a new form of embedded librarian and an extension of teaching librarians' functions in specific professional fields, but with higher comprehensive competency requirements.

#### *New Librarian Roles*

As libraries increasingly participate in school research and teaching as important instructional support, librarians face new challenges such as research data management. Researchers generate massive, widely distributed data including questionnaires, interviews, audio/video recordings, experimental data, and measurements, but lack data management awareness, risking data loss, privacy threats, and lost impact. Librarians can provide fundamental technical support for data management, helping researchers improve data management capabilities, thus creating the new data librarian role. Data management has shifted from a library service to a functional position, demonstrating clear demand and development trends. Librarian participation in research data management helps transform data into knowledge for greater value, requiring librarians to learn data management skills.

A survey of data librarians in foreign academic libraries shows the US has the most data librarian positions and practitioners, primarily holding doctoral and master's degrees with obvious multidisciplinary characteristics and emphasizing data management and analysis skills. A survey of medical librarians' participation in Electronic Medical Record (EMR) data management shows services mainly establish medical literature links and provide data services to patients via EMR, with medical librarians playing greater roles in healthcare data management. To qualify for data management work, librarians must conduct environmental scanning, identify needs, develop services, utilize technology to enable best practices, master data analysis and management tools, learn data management and preservation, and understand relevant data management policies. Thus, ordinary librarians must update extensive knowledge to become qualified data librarians.

Before social media, librarians consciously managed their social image through various media, highlighting their role in solving information search, location, use, dissemination, and comprehension problems. Social network use helps libraries present a humanized, friendly image, shortening distances with patrons. Libraries post resource announcements on social sites and integrate catalog search tools into social media, developing mobile apps to help faculty and students build social networks and promote other campus services. After social media popularization, library service efficiency improved, communication became faster,

and the library image more approachable, providing carriers for shared services. Some libraries have subdivided media librarian functions, establishing dedicated social media librarian positions.

Beyond library social media promotion and operation, social media librarians can build and maintain academic relationships, helping research professionals with mentorship relationships form supportive academic connections. A survey of librarians using Twitter in New Zealand and Australia found all respondents considered Twitter excellent for maintaining relationships, encouraging public interaction, obtaining peer support, and forming personal learning networks where users help and learn from each other based on shared goals. Librarians can also develop network information packages for social media use, helping researchers understand disciplinary frontiers and increase research visibility. Compared to current domestic social media-based information release and query services, this model demonstrates libraries' decentralization in future academic social networking and reader services, with librarian roles developing new dimensions.

### 3.2.4 Other Auxiliary Roles and Functions

Beyond the above roles, librarians undertake richer responsibilities exceeding traditional library services.

- (1) **Combating campus bullying:** With high rates of bullying in American schools and communities, public and school librarians pay close attention. They purchase relevant books, expedite cataloging, and must pre-read and screen content since quality varies and some advice is outdated or unhelpful. Libraries cultivate an image as respectful, safe spaces and develop resources to help teachers and guardians identify, prevent, and address bullying.
- (2) **Career planning and development:** Many North American high schools offer career guidance courses. When school counselors are overwhelmed, teaching librarians are introduced to career planning programs. Working with the entire school community, they leverage unique resource advantages (print/digital resources, research guides, information and technology literacy guides) and provide personalized assistance. They can also connect with university librarians to facilitate high school-to-university transitions. Many “what students need to know and do” for college and careers align with librarian work: core academic and professional skills, cross-cutting abilities (information and technology literacy, collaborative problem-solving, metacognition, learning skills), and education/career navigation skills. While promising, finding qualified teaching librarians remains challenging.
- (3) **Combating plagiarism:** Cultural differences and academic behaviors among “digital native” students prompt academic librarians to collaborate with faculty in monitoring academic misconduct. The popular “copy-paste” writing model requires redefining plagiarism and preventive mea-

asures. Librarians are well-suited to support teaching and research functions in academic integrity education, complementing faculty and graduate advisors. Current information literacy courses address academic misconduct to varying degrees through policy, behavioral norms, and consequence education. Librarians can help revise academic integrity regulations, raise awareness, increase academic integrity content in information literacy courses, and help schools and students address misconduct through embedded services. Specific measures include teaching reference management software, offering online courses, providing auxiliary services through information platforms, and offering plagiarism detection systems (e.g., Turnitin at York St John University and University of Salford) to help students identify and correct problems early.

### 3.3 Analysis of Foreign Librarian Role Transformation Characteristics

The above analysis shows librarian roles have expanded far beyond traditional professional definitions, inheriting library science's consistent professional characteristics while demonstrating important impacts from technological change, space renovation, evolving user needs, and library service transformation. Role transformation characteristics can be summarized as:

- (1) **Increasingly refined and professional role positioning with enhanced interactivity.** Traditional librarian roles were defined by libraries' major functions, with professional and detailed role descriptions far below current environmental demands. Libraries are growing organisms, and precisely describing position requirements helps build professional images and improve service efficiency. Additionally, librarians' service role interactivity has gradually strengthened, manifested in service scenarios, methods, and domains, communicating with patrons through online/offline tools, collaborating with colleagues and users from different backgrounds, intersecting responsibilities with related professions, and having potential for future expansion.
- (2) **Richer role descriptions with overlapping roles and multiple positionings,** requiring higher competencies while causing role ambiguity, conflict, and overload that create work anxiety and affect efficiency. Many scholars note librarians' work is far more difficult than users perceive, and innovative positions are hard to fill. Librarian roles are dynamically changing, with different role types having significantly different emphases. In many emerging service scenarios, librarians' roles have strengthened from supporters to leaders, while some traditional roles are gradually being integrated or replaced by technology. Librarianship has become a highly challenging profession.
- (3) **Significantly increased impact of technological environment on librarian roles.** Accelerating technological change and adoption have increased the speed of user information needs and librarian response times.

Some positions' technological dependency exceeds previous computer and internet eras, with technology-related work becoming main content for certain positions, and many library innovative services completely relying on technological innovation. This is evident in many librarians' changing job responsibilities.

This study searched foreign journal literature on librarian roles using title fields. Due to database resources, search strategies, and research characteristics, the material types may be singular and cannot fully reflect foreign librarian role development. Since multiple librarian roles overlap (e.g., subject, embedded, and teaching librarians are often the same group undertaking multiple roles), classification descriptions cannot be completely rigorous. Due to varying research output across fields, university librarian studies far exceed other library types, requiring richer materials (blogs, websites, reports, cases) for supplementation in future analyses. Title word analysis, while effective, has relatively limited corpus and may not fully reveal role development characteristics. Future research should use empirical methods to investigate actual role positioning and responsibility fulfillment, deeply exploring some positions to more intuitively reflect librarians' professional images in era transformation.

## References

- [1] Wang Yujian, Yan Xiaoyan. Building Librarians' Business Capacity to Adapt to Development and Change [J]. *Journal of Academic Libraries*, 2008(2): 105-108.
- [2] Ilesanmi TC. Roles of the Librarian in a Research Library in the Digital Era: Challenges and the Way Forward [J]. *New Review of Academic Librarianship*, 2013, 19(1): 5-14.
- [3] Luo Xiaolan. Librarian Technology Pressure: Transformation and Countermeasures [J]. *Library and Information Service*, 2015, 35(5): 165-167.
- [4] Shupe EL, Wambaugh SK, Bramble J. Role-related Stress Experienced by Academic Librarians [J]. *Journal of Academic Librarianship*, 2015, 41(3): 264-269.
- [5] Qiu Qingdong. Research on Librarian Role Positioning and Innovative Services in Big Data Environment [J]. *Library and Information Service*, 2015, 35(12): 143-147.
- [6] Hou Mingyan. Role Transformation of University Librarians in Smart Library Environment [J]. *Modern Information*, 2015, 35(12): 143-147.
- [7] Yuan Dairong. Librarian Role Transformation under Information Commons [J]. *Library*, 2011(5): 98-100.
- [8] Lang Qinghua, Xue Haibo. Librarian Role Positioning in Institutional Repository Content Construction and Service [J]. *Modern Information*, 2011, 31(10): 15-18.
- [9] Jiang Haichao. Exploration of Public Library Picture Book Librarian Roles—A Case Study of Guangzhou Library [J]. *Library and Information Service*, 2016, 60(S1): 215-219.

- [10] Yang Shuai. Discussion on University Librarian Roles for MOOCs [J]. *New Century Library*, 2015(2): 38-41.
- [11] Wang Fang. A Glimpse of American Academic Librarians' Responsibilities, Skills, and New Roles [J]. *Modern Information*, 2015, 35(12): 143-147.
- [12] Bray M, Hollands WRT. School Library Media Specialists: What's in a Name? A Lot it Seems... [J]. *Tech Trends*, 2011, 55(4): 19-20.
- [13] Johnston MP. School Librarian + Technology Specialist, Partnership for Effective Technology Integration [J]. *Knowledge Quest*, 2013, 42(9/10): 70-75.
- [14] Ardinga S, McLeod S. The Role of Canadian Public Librarians in Promoting Health Literacy: Potential Programs and Partnerships [J]. *Partnership: The Canadian Journal of Library and Information Practice and Research*, 2013, 8(2): 1-7.
- [15] Kargbo JA. The Role of Public Librarians in Disseminating Information for True Democracy [J]. *Public Library Quarterly*, 2014, 33(4): 362-371.
- [16] Cooper ID, Crum JA. New Activities and Changing Roles of Health Sciences Librarians: A Systematic Review, 1990-2012 [J]. *Journal of the Medical Library Association*, 2013, 101(4): 268-277.
- [17] Tarver T, Jones DA, Adams M, et al. The Librarian's Role in Linking Patients to Their Personal Health Data and Contextual Information [J]. *Medical Reference Services Quarterly*, 2013, 32(4): 459-467.
- [18] Zeblicky K, Birr R, Sjursenguerreo AM. Effecting Change in an Evidence-Based Medicine Curriculum: Librarians' Role in a Pediatric Residency Program [J]. *Medical Reference Services Quarterly*, 2015, 34(3): 370-381.
- [19] Riedner MB. Librarians' Role as Part of the Care Team for Alzheimer's Patients [J]. *Journal of Consumer Health on the Internet*, 2015, 19(2): 143-147.
- [20] Rossini B, Burnham J, Wright A. The Librarian's Role in an Enrichment Program for High School Students Interested in the Health Professions [J]. *Medical Reference Services Quarterly*, 2013, 32(1): 73-83.
- [21] Beales DL. Health Literacy [J]. *Journal of Hospital Librarianship*, 2005, 5(3): 17-27.
- [22] Howse DK, Bracker PJ, Keim SM. Technology Mediator: A New Role for the Reference Librarian? [J]. *Biomedical Digital Libraries*, 2006, 3(1): 10-15.
- [23] Buston LC, Pauly RR. A Librarian's Role in Enhancing Patients' Knowledge and Self-Advocacy [J]. *Journal of Hospital Librarianship*, 2013, 13(4): 362-372.
- [24] Yu Liying. Professional Quality of Law Librarians: AALL Competency Requirements for Law Library Personnel [J]. *Legal Document Information and Research*, 2005(2): 61-63.
- [25] Wright NL. Standing at the Gates: A New Law Librarian Wonders About the Future Role of the Profession in Legal Research Education [J]. *Legal Reference Services Quarterly*, 2009, 27(4): 305-345.
- [26] Slinger M, Slinger R. The Law Librarian's Role in the Scholarly Enterprise: Historical Development of the Librarian/Research Partnership in American Law Schools [J]. *Social Science Electronic Publishing*, 2010, 39(3): 387-410.
- [27] Steve M. How Can Law Librarians Most Effectively Provide Legal Research Training? [J]. *Legal Information Management*, 2017, 17(1): 34-68.

- [28] Mercy Ifeyinwa A, Roseline Nkech OE, Uju Nwamaka A. Law Libraries in Information Age: The Role of Academic Law Librarians [J]. *Information & Knowledge Management*, 2013, 3(12): 112-118.
- [29] Miguel-Stearns T, Ryan SE. The Empirical Research Law Librarian Part 1: Making the Case and Filling the Role [J]. *Trends in Law Library Management and Technology*, 2014, 24(24): 1-6.
- [30] Warner EJ. The Power of Encouragement: The Role of Christian Academic Librarians in Supporting the Whole Student [J]. *The Christian Librarian*, 2016, 59(3): 94-103.
- [31] Kemmis B. The Theological Librarian's Role in Fundraising [J]. *Theological Librarianship*, 2009, 2(1): 57-63.
- [32] Gu Xiaoguang. Longquan Library [J]. *Library Development*, 2017(7): 2-2.
- [33] Huang Qinling, Li Li, Zheng Yanhua, et al. Embedded Subject Service Innovation Practice and Characteristics for Internationalization Departments—A Case Study of Mechanical Power Subject Service at Shanghai Jiao Tong University Library [J]. *Library and Information Service*, 2012, 56(21): 67-71, 96.
- [34] Huang Qinling, Guo Jing, Gao Xie, et al. Deep Integration Innovation Practice of Mobile Learning and Embedded Subject Services—A Case Study of Shanghai Jiao Tong University Library [J]. *Library and Information Service*, 2014, 58(2): 79-83, 58.
- [35] Bedi S, Wald RC. Transforming Roles: Canadian Academic Librarians Embedded in Faculty Research Projects [J]. *College & Research Libraries*, 2017, 78(3): 314-327.
- [36] Stachokas G. The Electronic Resources Librarian: From Public Service Generalist to Technical Services Specialist [J]. *Technical Services Quarterly*, 2018, 35(1): 1-27.
- [37] James N, Shamchuk L, Koch K. Changing Roles of Librarians and Library Technicians [J]. *Partnership: The Canadian Journal of Library and Information Practice and Research*, 2015, 10(2): 1-29.
- [38] James N, Shamchuk KL. The Elephant in the Room: Changing Roles of Librarians and Library Technicians [EB/OL]. [2018-06-20]. [https://www.researchgate.net/publication/263537051\\_{{THE}}\\_{{ELEPHANT}}\\_{{IN}}\\_{{THE}}\\_{{RO}}](https://www.researchgate.net/publication/263537051_{{THE}}_{{ELEPHANT}}_{{IN}}_{{THE}}_{{RO}})
- [39] Julien H, Genuis SK. Librarians' Experiences of the Teaching Role: A National Survey of Librarians [J]. *Library & Information Science Research*, 2011, 33(2): 103-111.
- [40] Wheeler E, McKinney P. Are Librarians Teachers? Investigating Academic Librarians' Perceptions of Their Own Teaching Skills [J]. *Journal of Information Literacy*, 2015, 9(2): 111-128.
- [41] Austin T, Bhandol J. The Academic Librarian: Buying Into, Playing Out, and Resisting the Teacher Role in Higher Education [J]. *New Review of Academic Librarianship*, 2013, 19(1): 15-35.
- [42] Li Ling. Embedded Reference Services: Characteristics, Models, and Prospects [J]. *Library and Information Service*, 2013, 57(22): 18-22.
- [43] Li Shanshan. Collaborative Innovative Embedded Service Model for "Maker" Groups in Libraries [J]. *Library and Information Service*, 2015, 59(13):

63-67, 95.

- [44] Chu Jingli, Kong Qingqing, Luan Guannan. Research Progress on Embedded Subject Services [J]. *Library and Information Service*, 2013, 57(22): 11-17.
- [45] Brahmi FA, Kaplan FTD. Embedded Librarian as Research Team Member [J]. *Journal of Hand Surgery*, 2017, 42(3): 210-214.
- [46] Feng J, Zhao NX. A New Role of Chinese Academic Librarians—The Development of Embedded Patent Information Services at Nanjing Technology University Library, China [J]. *Journal of Academic Librarianship*, 2015, 41(3): 292-300.
- [47] Keane B. Assessment and Impact of a New Role as an Embedded Librarian in Nursing Online Journal Clubs [J]. *Journal of the Medical Library Association*, 2013, 101(4): 335-338.
- [48] Boyer B. Designer Librarian: Embedded in K12 Online Learning [J]. *Tech Trends*, 2015, 59(3): 71-76.
- [49] Konieczny A. Experiences as an Embedded Librarian in Online Courses [J]. *Medical Reference Services Quarterly*, 2010, 29(1): 47-57.
- [50] Martzoukou K, Tramantza AE. Virtual Embedded Librarianship for Information Literacy Teaching [J]. *Communications in Computer & Information Science*, 2014, 492: 446-455.
- [51] Beck D. The Online School Librarian: Roles and Responsibilities [J]. *Tech Trends*, 2015, 59(3): 77-84.
- [52] Waite K, Gannonly LEAR, Carr J. The Role and Responsibilities of an e-Tutor Librarian [J]. *Journal of Library & Information Services in Distance Learning*, 2011, 5(4): 129-148.
- [53] Kavanaugh JR, Lavalley K, Miller A. The Role of Embedded Librarians in Educational Health Resources: Two Case Studies [J]. *Journal of Consumer Health on the Internet*, 2018, 22(1): 72-84.
- [54] Cox A, Verbaan E, Sen B. A New Role for Academic Librarians? Research Data Management [J]. *Multimedia Information & Technology*, 2012, 38(4): 29-31.
- [55] Cui Yuhong, Chu Hengya, Li Feng. Investigation and Analysis of Data Librarian Career Development in Academic Libraries [J]. *Library and Information Service*, 2017, 61(6): 67-72.
- [56] Corbett M, Deardorff A, Kovar-Gough I. Emerging Data Management Roles for Health Librarians in Electronic Medical Records [J]. *Journal of the Canadian Health Libraries Association*, 2014, 35(2): 55-59.
- [57] Martin ER. The Role of Librarians in Data Science: A Call to Action [J]. *Journal of eScience Librarianship*, 2016, 4(2): e1092.
- [58] Caroline RFB. The Social Role of the Librarians of the Federal Institute of Education, Science and Technology [C]//IASL Conference Reports. Bali, Indonesia, 2013: 109-120.
- [59] Fletcher J. Social Networking Fires Up Academic Librarians [J]. *Multimedia Information & Technology*, 2010, 36(4): 20-21.
- [60] Willemse EA. TwiMentoring: Librarians Using Twitter Informing and Cultivating Mentoring Relationships [J]. *Beyond Mentoring*, 2017: 75-92.

- [61] Persson S, Svenningsson M. Librarians as Advocates of Social Media for Researchers: A Social Media Project Initiated by Linköping University Library, Sweden [J]. *New Review of Academic Librarianship*, 2016(2): 2-3.
- [62] Becnel K. Sticks, Stones, and Sneering Tones: The Librarian's Role in Ending the Bullying Epidemic [J]. *Children and Libraries*, 2013(winter): 10-15.
- [63] Farmer L. Ready to Get Students College Career Ready? What's the Teacher Librarian's Role? [J]. *California School Library Association Journal*, 2016(summer): 12-13.
- [64] Germek GP. Imagine No Possessions: Librarians, the Net-Generation Student, and the Imminent Victory of Plagiarism [J]. *College & Undergraduate Libraries*, 2009, 16(4): 338-357.
- [65] Spring H, Adams R. Combating Plagiarism: The Role of the Health Librarian [J]. *Health Information & Libraries Journal*, 2013, 30(4): 337-342.

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## The Role Challenge and Characteristics of Foreign Librarians in Technological Environment Change

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**Abstract:** [Purpose/Significance] With the change of library technology environment and the expansion of library functions, the role and image of librarians are endowed with many new expectations. The analysis of the role change trend of librarians can not only understand the requirements of environmental change on career development, but also provide suggestions for the improvement of the quality of librarians and the pressure of coping with technological change. [Method/Process] Using the bibliographic information of English periodicals collected from the database, this paper analyzes the role of librarians in existing research and describes the job responsibilities of librarians according to their roles. [Result/Conclusion] Existing research pays significant emphasis on the academic librarian, teaching librarian and medical/health/clinical librarian. Technological change has also led to the emergence and attention of data librarians, social media librarians and digital resource librarians. The role of librarian is characterized by more detailed and professional role classification, increasing interactivity and obvious professional role overlapping. The influence of technology on librarian's professional role is gradually increasing.

**Keywords:** librarian; role change; technology adoption

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